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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 HANFORD PROJECT OFFICE  
712 SWIFT BOULEVARD, SUITE 5  
RICHLAND, WASHINGTON 99352

June 15, 1995

Julie Erickson  
U.S. Department of Energy  
P.O. Box 550, H6-83  
Richland, Washington 99352


Re: 100 Area Source Operable Unit Focused Feasibility Study  
Report Comments


Dear Ms. Erickson:

This correspondence is in regard to the 100 Area Source Operable Unit Focused Feasibility Study Report (DOE/RL-94-61 Rev 0) provided to the U.S. Environmental Protection Agency and the State of Washington Department of Ecology for review on May 12, 1995. In the interest of avoiding any further delays to the initiation of public comment on the 100-B/C-1, 100-DR-1 and 100-HR-1 Proposed Plans, which are supported by the above referenced report, this correspondence and attached comments will not require formal response or revisions to the report. Instead these comments will serve to augment the Administrative Record where the regulatory agencies believe additional information will help to support the identified preferred alternative in the Proposed Plans. The Tri-Parties have agreed to this process in the interest of directing resources towards remediation in lieu of additional documentation of the remedial investigation and feasibility study phase.

If you should have any questions regarding the above, please call either Steve Alexander of Ecology at (509) 736-3045 or Kevin Oates of the EPA at (509) 376-6623.

Sincerely,

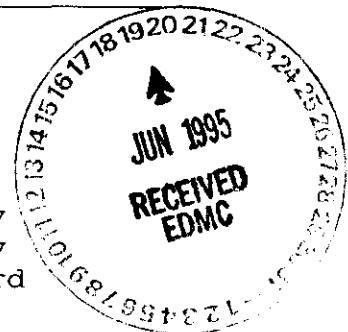
  
Steven M. Alexander  
Washington State Department  
of Ecology

  
Kevin J. Oates  
U.S. Environmental  
Protection Agency

Enclosure

cc: Nancy Werdel, DOE  
Greg Eidam, ERC  
Dennis Faulk, EPA  
Larry Gadbois, EPA  
Keith Holliday, Ecology  
Pam Innis, EPA

Phil Staats, Ecology  
Wayne Soper, Ecology  
Administrative Record  
(100 Area)



## General Comments

1. At several points in the specific comments, it is stated that the regulatory agencies believe there are statements that are misleading, inaccurate and/or that the agencies disagree with the statements. This does not infer that the agencies believe the report is fundamentally flawed, rather that specific areas of the report do not adequately reflect the agencies positions, policies or guidelines. In certain instances these are reflective of previously submitted comments. EPA and Ecology believe this comment letter sufficiently addresses any remaining concerns, particularly from the standpoint of satisfying administrative record requirements for identifying a preferred alternative and subsequent remedy selection.

2. The Process Document sections of the report consistently discusses the use of a three foot exposure zone in the context of a point of compliance for protection of human health. These representations are not supported by the regulatory agencies and are inconsistent with the agreed upon regulatory framework, particularly with respect to soil exposure considerations under the Model Toxics Control Act. The reader of this portion of the document needs to be aware of the fact that the baseline condition of an occasional use scenario was the object of extensive comments by the regulatory agencies. That scenario is not representative of all regulatory considerations, and therefore additional information is presented in subsequent sections of the report that provides a broader range of evaluations.

3. Specific comments are not provided on all of the operable unit specific FFS reports attached to the Process Document (Appendix E, F and G). Comments are presented on Appendix E for the 100-HR-1 FFS since it was used as a template for the 100-BC-1 and 100-DR-1 FFS reports. Therefore, comments presented on Appendix E apply to parallel discussions in Appendix F and G. As with all of the specific comments presented herein, they are presented in order of a front to back reading of the document. While this has resulted in the repetition of certain themes due to multiple presentations of the same or similar topics, the regulatory agencies believe it is the most functional method to augment the report.

4. The ten sites listed in the table below were designated by the TriParties as high priority sites that received radioactive liquid effluent discharges. Furthermore, these sites are similar or analogous to one or more of the 30 high priority sites that received radioactive liquid effluent discharges identified in the soon to be released 100-BC-1, 100-DR-1 and 100-HR-1 Proposed Plans as candidates for interim remedial measures (IRMs). For various reasons, such as incomplete conceptual site models (i.e. variable data results from non-contemporaneous sampling events), these 10 sites were not evaluated as candidates for IRMs in the Process Document or the OU-specific FFS analyses.

However, the Phase 1 and 2 Feasibility Study Report (DOE-RL-92-11), as well as the Process Document and OU-specific FFS analyses rely on the "analogous site type" approach for evaluation of many of the 30 waste sites. That is, for sites where there is little or no actual field data, similar or "analogous" site information is utilized in undertaking the FFS evaluations. That information includes extrapolation of the likelihood of the presence and concentration range of contaminants based on similar, historic process knowledge. This approach, taken together with the Observational Approach that merges characterization activities with remediation activities, emphasizes the application of resources to remediation rather than to additional studies.

EPA and Ecology's analyses indicates that the 10 sites listed in the table below are viable candidates for IRMs based on the analogous site type approach. The far right hand column of the table indicates those sections of the Process Document where a site that is analogous to one of the 10 additional sites is compared and contrasted against the CERCLA evaluation criteria. Those analyses, along with the existing field data for some of the sites, process discharge knowledge, the use of the analogous site approach (see section 3.2 of the Process Document for a more in depth discussion of this topic) and the emphasis on the Observational Approach together present sufficient information such that the identification of the 10 remaining sites to the public as also being IRM candidates would be consistent with the existing FFS and IRM pathways for the other 30 sites.

**10 ADDITIONAL HIGH PRIORITY LIQUID RADIOACTIVE DISPOSAL  
SITES FROM 100-BC-1, 100-DR-1, AND 100-HR-1**

OU	SITE	NUMBER	FFS SECTION
100-BC-1	Fuel Storage Basin Trench	116-B-2	6.4.2
	Pluto Crib	116-B-3	6.4.5
	Crib	116-B-6A	6.4.5
	Crib	116-B-6B	6.4.5
	French Drain	116-B-9	6.4.6
	Dry Well/Quench Tank	116-B-10	6.4.6
100-DR-1	Crib	116-D-4	6.4.5
	Crib	116-D-9	6.4.5
	French Drain	116-D-6	6.4.6
100-HR-1	Effluent Disposal Trench	116-H-2	6.4.3

## Specific Comments

1. Page V, Paragraph One. The regulatory agencies disagree with the representations of how preliminary remediation goals (PRGs) are developed and evaluated. In the FFS report, PRGs are represented such that it appears that the numerical results of the Summers Model and risk analysis constitute all of the PRG values presented. This is not consistent with the National Contingency Plan (NCP). The NCP and EPA guidance documents clearly delineate that risk based PRGs, other than those identified as ARARs, should be developed and evaluated only when no numerical value has been promulgated under an existing ARAR. In such a manner, PRGs are meant to compliment ARARs, not to supplant them. Furthermore, the Summers Model exercise and subsequent numerical results have utility for screening purposes only, and should not be considered for other uses (e.g. establishing cleanup levels).

2. Page VI. The language pertaining to a "new remediation approach" is misleading. No new remedial alternative, technology, or mode of implementation were developed or presented by the Tri-Parties. Agreement on ARARs was achieved that corresponded very closely to an already developed scenario - the frequent use scenario. This fact is noted in the text on this page and in subsequent analyses presented in the appendices.

3. Page 2-1 Paragraph 3. See the above discussion regarding PRGs. In addition, regarding the last sentence, remediation criteria are presented in the proposed plans. As a further point of clarification, the regulatory framework for remediation was agreed to in January/February, 1995. Legally enforceable criteria will be delineated in the record of decision.

4. Page 2-5, Paragraph 3. This section would have had more relevance if information had been presented from the literature on phytotoxicity to specific plant species, not merely on a "generic plant".

5. Page 2-6, Paragraph 1, As noted in the general comments, referring to the top three feet of soil "exposure zone" as the point of compliance is misleading in that it is not representative of the agreed upon regulatory framework.

6. Page 2-7 Section 2.5 See comment 1 above regarding PRGs.

7. Page 2-8. As noted in previous comments submitted by EPA and Ecology, the statements concerning lack of eco-risk assessment methodology are inaccurate. There is extensive published guidance on this area by EPA and others. Furthermore, DOE-RL has published Hanford-specific eco-risk assessment methodologies (see Hanford Site Risk Assessment Methodology DOE/RL-91-45).

8. Pages 2-8 and 2-9. The language presented here with respect to uncertainties concerning eco-risk estimates for the 100 Area

does not reflect the comment resolution discussions held by the Tri-Parties in November and December 1994. DOE and its contractor, at the repeated urging of the regulators, reviewed contaminants that would drive remediation for human-risk versus eco-risk. It was found that for most contaminants, remediation to achieve human risk goals would achieve eco-risk goals as well. However, it was noted that strontium-90 and technetium-99 would require slightly more stringent remediation levels in order to be protective of ecological receptors.

While it is noted that subsequent text recognizes the inherent uncertainties associated with eco-risk considerations for Sr-90 and Tc-99, the introductory discussion is misleading.

9. Page 2-13, Paragraph 1: The statement ...."therefore only specific sections of the regulations may be an ARAR" is inaccurate.

10. Provide citation for draft EPA-ERC guidance. Chapter 2 should have provided the citation for guidance. It is 40 CFR 196.

11. Pages 2-8 and 3-10: The wording here should have consistently stated that PRGs are derived from an incremental cancer risk (ICR) of  $1 \times 10^{-6}$  based on an occasional land use assumption.

12. Page 4-30: The presentation of No Action "applicability" when contaminant concentrations are less than PRGs is unusual, especially since the PRGs were developed from a modeling effort and not a full consideration of ARARs.

As stated above, PRGs are used to (a) screen sites, (b) compliment ARARs where no chemical specific criteria has been established. A No Action Alternative is used as a baseline for comparison and can be a selected alternative based on results that indicate acceptable risk levels, and the outcome of the CERCLA nine criteria evaluation.

The Institutional Control "applicability" discussion is also somewhat unusual for similar reasons.

13. Page 5-10, Paragraph 1, Last Sentence: This sentence is inaccurate. Preliminary design work has essentially commenced for 100 Area activities through the initiation of the 100-BC-1 Expedited Response Action, and through incorporation of the results and information from RD/RA work plans for the 118-B-1 Excavation Treatability test, the 100 Area Soil Washing Treatability study, and the 316-5 Process Trench Expedited Response Action. This does not adversely impact activities that may be required for mitigation measures, rather it will serve to compliment those activities by providing additional in-the-field

information from already completed, similar activities rather than conjecture.

Paragraph 3: It is unnecessary to prescribe in an FS that mitigation plans "will be....made part of the contractual obligations for remedial contractors working on the site." Such a determination should be made during RD. There may be more efficient, and/or cost-effective avenues to implement mitigation plans than through specified remedial contractors.

14. Page 5-16, Paragraph 2: EPA and Ecology maintain their position with respect to the cost estimates provided in this FFS. That is, the estimates are overly conservative and likely have over-estimated the cost of remedial action. Previous analyses were provided by the regulatory agencies to DOE on this topic (see attached March 27, 1995 letter from D. Sherwood, S. Alexander to L. McClain). In the past, DOE has presented the perspective that additional cost estimation analysis might not provide a more accurate estimate of the cost of remedial actions, and requested that additional cost analysis not be undertaken. In the interest of directing resources towards remediation rather than additional studies, it was mutually agreed to that the cost estimates provided in the FFS would be presented as overly conservative and for the purposes of comparative analysis only.

15. Page 5-16, Section 5.3.1 No Action: It is not intended to be presented as an applicable alternative for some sites and not applicable for others. The function of the No Action Alternative is to provide a baseline of comparison to other alternatives that require some level of action. The statements in paragraph 2 of the section beginning with..."implementing no action..." are accurate and reflect the regulator agencies view of No Action with respect to the waste sites. Much of the subsequent analysis related to the "applicability" of the No Action alternative is unnecessary.

16. Pages 5-33 and 5-34 are missing. The missing text covers aspects of the detailed analysis of the Remove/Dispose Alternative, specifically Reduction of Toxicity, Mobility or Volume; Short-Term Effectiveness; and Costs. These will need to be inserted prior to further publication of the report.

17. As a point of clarification, the CERCLA evaluation criteria described as Reduction of Toxicity, Mobility or Volume should also read "through treatment".

18. Page 5-48: The statement "ARAR compliance difficult" for the Removal/Treatment/Disposal Alternative is not supported by the text and accompanying analysis. This alternative is a very basic remedial action with routinely achievable ARARs. The only potential ARAR that has been brought to the attention of the regulatory agencies as possibly presenting difficulty with compliance is the treatment aspects of the Land Disposal Restrictions (LDRs). The concern raised has been related to

three soil samples for individual metals that exceed the "20 to 1" rule of thumb related to the Toxic Characteristic Leaching Procedure (TCLP) where individual metal concentrations detected are more than twenty times the TCLP criteria. Therefore the samples could potentially fail the TCLP, thereby triggering the treatment provisions of the LDRs. It is of note that no TCLP tests have been performed on the soils in question, nor has a treatment evaluation been undertaken that would indicate achievement of LDR treatment standards would be difficult, thereby making ARAR compliance difficult.

For the primary ARARs, (MTCA, SDWA, CWA) and the primary TBC (EPA/NRC 15 mrem/yr guideline) compliance for over 90% of the waste is expected to be easily achieved since they are small, shallow sites. Only for very deep sites where there is no human soil exposure pathway is achievement of compliance in question at this juncture, and in those cases, the current view is the issue will be one of balancing of the CERCLA criteria, rather than an issue of technical infeasibility.

19. Page 6-1, Paragraph 1: The comparative analysis is not the ...."basis for selecting a Remedial Alternative." The administrative record provides a number of technical documents, public comments, site information, etc., that form the basis for identifying candidate remedial alternatives, identifying a preferred alternative and ultimately selecting a remedial alternative in a record of decision. A comparative analysis chapter in an FS presents key information that ultimately will play a role in remedy selection.

20. Page 6-3, Section 6.1.4: It would be more accurate to indicate that Administrative Feasibility considers such factors as the necessity and/or ability to receive and comply with any activities requiring permits or meeting substantive requirements when formal permits are not required, rather than an evaluation concerning whether an interim action be consistent with a final action.

21. Costs: See March 27, 1995 letter and attachment from D. Sherwood and S. Alexander to L. McClain (attached).

22. Section 6.3 Scoring and Weighting Rationale: EPA and Ecology view this exercise as subjective. The first two subsections indicate that scoring and weighting both contain elements of subjectivity. Previous comments provided by the regulatory agencies indicated that a discussion based on professional judgement would be preferable to a weighting, or the "pie chart" approach as was initially provided.

23. Section 6.4 Comparison of Remedial Alternatives: EPA and Ecology disagree with the use of subjective terminology that indicates a specific alternative as ...."the best." Previous comments provided to DOE objected to such terminology. It is the position of the regulatory agencies that a feasibility study

report should present an objective comparison of the ability of the respective alternatives in either satisfying or not satisfying the CERCLA evaluation criteria. Such information, together with additional information in the Administrative Record, public comments on the Proposed Plan and Administrative Record, would then lead to selection of a remedy in the ROD. This process should be as open and unbiased as possible. Presenting terminology that identifies one alternative as "the best" based on subjective, limited scoring and weighting can unduly influence the public process.

The text presented under the specific criteria analysis provides a more objective discussion of relative and comparative merits in addressing the CERCLA criteria.

24. Appendix A, Page A-3, Paragraph 1: As discussed in previous comments, the definition of PRGs and the development of PRGs based solely on a risk modeling effort for an occasional use risk scenario is inadequate. Such risk-based values should only be considered in the absence of ARARs. ARARs have been identified for the 100 Area and have been agreed to by the Tri-Parties for the proposed plans for 100-BC-1, 100-DR-1 and 100-HR-1. Those ARARs are listed in the FFS report.

25. Page A-3, last 2 paragraphs: It would be more accurate to state that Section 2.0 describes a scenario and potential exposure pathways for receptors to waste site contaminants.

26. Page A-5, Section 2.3, Paragraph 2: EPA and Ecology do not support the following position stated by DOE in the text; "the zone of contact for humans, therefore, is the 0 to 1 m (0 to 3 ft) strata. This may also be referred to as the point of compliance for regulatory purposes."

27. Page A-5, last paragraph: EPA and Ecology do not support the position presented by DOE that ...."The preliminary remediation goals based on human health are applicable at the 0 to 1 m (0 to 3 ft) strata." Furthermore, the position that human health PRGs will meet all ecological based PRGs, therefore, human health PRGs are applicable to the 3m (0 to 10 ft) strata, is also not supported by the regulatory agencies. It is the position of the regulatory agencies that this statement does not reflect the regulatory framework agreed to by the Tri-Parties (see above referenced 3/27/95 letter). The purposes of describing the base FFS condition developed and evaluated by DOE, the discussion in this section has some utility. However, it is imperative that administrative record clearly defines the limitation on this analysis. The Appendix A alone does not adequately represent the limitations. However, this comment, in the opinion of EPA and Ecology, augments the discussion satisfactorily.

28. Page A-11/12: EPA and Ecology disagree with the statement here that ...."the DOE Orders are the only available source of soil limits in the context of evaluating cleanup goals for

radionuclides in soils. EPA released an Issue Paper on Radiation Site Cleanup Regulations in September 1993. That issue paper is part of an ongoing multi-agency effort undertaken by EPA, DOE, DOE, NRC, interested states and other parties to address remediation of sites contaminated with radionuclides (see EPA proposed rule making, May 1994). Several citations and proposed rules are identified in the issue paper in addition to DOE Orders. Since the publication of that paper, EPA and NRC have issued a draft rule making to establish cleanup for radionuclides in soils at 15 mrem/yr above background. For the purposes of the proposed remedial actions for 100-BC-1, 100-DR-1, and 100-HR-1, the Tri-Parties have agreed to the draft EPA/NRC guideline of 15 mrem/yr above background.

29. Pages A-12 to A-15 Summers Model: EPA and Ecology do not support the interpretations of the modeling effort presented here. The initial submittal of the FFS and Summers Model contained an excessive degree of conservatism, such that projected soil remediation levels for many constituents was one to three orders of magnitude lower than existing State and Federal criteria and guidelines. The regulatory agencies provided comments to DOE identifying model input parameters that were overly conservative and that were the primary factor affecting the end results. At that time, the regulatory agencies also indicated clearly to DOE that revisiting the modeling effort would not be necessary since the regulatory agencies view that the most useful function of the model results was for screening purposes, and should not be considered as a vehicle to establish cleanup levels.

30. For the purposes of the Administrative Record, EPA and Ecology strongly believe the following points of clarification need to be presented and available in the Administrative Record.

a. The regulatory agencies disagree with the statement on page A-15 that states ...."The Summers Model aids in delineating which sites require remedial action and how much action is required."

b. The decision to expend resources to pursue additional modeling efforts was a decision on the part of DOE. The regulatory agencies did not receive the results of the remodeling effort until May 12, 1995, more than six months after clearly stating to DOE that additional modeling not only was not required, but that the modeling had limited value with respect to cleanup goals or cleanup actions.

c. The Tri-Parties agreed to undertake accelerated action in the 100-BC-1 Area in order to address several areas of uncertainty regarding proposed actions for remediation of 100 Sources Area. For the first three proposed plans (100-BC-1, 100-DR-1, 100-HR-1) six waste sites have been identified that may be potential candidates for some combination of radiological decay and/or wastes left in place above ARARs or TBCs. These are all deep sites (contamination begins below 15 feet) where protection

of groundwater is the primary concern. For such sites, modeling and a compliance monitoring program to demonstrate protection of groundwater as a resource may be required. The in-the-field information collected during the 100-BC-1 Expedited Response Action this summer will help to determine relevant parameters, inputs and considerations when balancing attainment of ARARs, costs, limiting ERDF footprint, limiting natural resource and cultural resources impacts, worker health and safety, etc. This philosophy and approach has been discussed among the Tri-Parties at great length over the past several months.

d. EPA and Ecology have not undertaken an additional review of the modeling effort for the reasons stated above. Any representation of the validity, use in developing PRGs and relationship to soil cleanup levels for 100 Area remedial actions reflects a position developed and presented solely by DOE. EPA and Ecology remain committed to utilizing information developed during the course of expedited response actions this summer at 100-BC-1 along with the other site-specific information from the limited number of deep sites to determine if (a) modeling has utility and (b) to what extent modeling could aid in evaluating the extent of remedial actions at those sites.

31. Appendix B, Comment Summaries: See 3/27/95 letter and attachment. As discussed in that letter, costs are believed to be overestimated.

32. Appendix C - ARARs: EPA and Ecology also consider the Safe Drinking Water Act to be an ARAR for the 100 Area remedial actions. In addition, the following are TBCs: draft EPA/NRC guidelines; contents of 9/93 white paper and 4/94 rule making referenced above.

33. Appendix D, Page D-3, Last Paragraph, Executive Summary: EPA and Ecology disagree with the representation made in the text here that states; ...."During Tri-Party negotiations in January and February of 1995 (following preparation and review of the initial draft of this sensitivity analysis) a new land use and remediation scenario emerged and was developed by the Tri-Parties."

Final agreement on ARARs was achieved in the January-February timeframe that was consistent with a scenario that was already present in the FFS (frequent use) and consistent with stated value of achieving unrestricted use of the 100 Area.

34. Page D1-3, Second Paragraph and D2-1, Paragraph 2: The actual exposure durations evaluated for the occasional use (recreational) was 56 hours (8 hours for 7 days) and for residential was 365 days.

35. Page D1-3, Section 1.3, First Paragraph: EPA and Ecology agree with the statements in this paragraph regarding the development of final remediation goals. It is the expectation of

both agencies that the Record of Decision for the three proposed plans will reflect the agreed to regulatory framework, associated ARARs and cleanup criteria. (See 3/27/95 letter referenced above)

36. Page D2-2, Section 2.1.2: EPA disagrees with the approach taken regarding multiplication of MCLs and agrees with the statement that this approach ...."is unusual and could be in conflict with ARARs or other technical risk considerations."

37. Page D4-5, Section 4.2.2: EPA and Ecology do not agree with the statement that..."ARAR themselves may change as exposure scenarios change..." An exposure scenario under a risk assessment does not drive ARAR selection. A determination made to pursue remedial actions is based on such considerations as does a release to the environment pose an unacceptable risk, which in turn triggers evaluation of remedial alternatives, and then selection of ARARs to guide remedial actions. The regulatory agencies do agree with the second sentence in this section regarding ARAR selection.

38. Page D5-1: It does not seem reasonable that there would be no change to volume or cost when going from  $10^{-4}$  to  $10^{-6}$  risk-based cleanup level, since this would correspond to a two order of magnitude shift in contaminant concentration.

39. Page DA6-7: The regulatory agencies disagree with the statement that..."Because the revised frequent-use scenario has been established, the effectiveness of the viable alternatives must be considered again." This analysis duplicates analyses presented earlier in the report.

40. Page DA6-3: As noted in previous comments, the revised frequent use scenario was developed by DOE. The regulatory agencies position has been maintained constantly that the scenarios developed and presented in the previous submittal of the Process Document adequately addressed cleanup options and that ARARs would govern remedial actions.

41. Page DA6-4, Second to Last Paragraph, Second Sentence: The standard should read 15 mrem/yr, not 115 mrem/yr.

42. Page DA6-5: EPA and Ecology are concerned that the language presented in the text regarding a 15 foot point of compliance could be interpreted that remediation would not occur below 15 feet. This is not consistent with the agreed to regulatory framework.

43. Page DA6-5, Second Bullet, Section 2.3: Should read "protection of fish", not "consumption of fish".

44. Page DA6-5: Documents have been produced, and reviewed by the Tri-Parties. Model revisions were a decision made by DOE.

As noted in previous comments, the use of the Summers Model was appropriate only for screening purposes.

45. Page DA6-8, Last Sentence Under Section 4.0: The regulatory agencies agree with the statement concerning the revised frequent-use scenario that state it includes remediation goals that were included in exposure scenarios in the Sensitivity Analysis and does not introduce any new issues that were not discussed in the Process Document and Sensitivity Analysis.

46. Page DA6-15 and 16: The 100 Area Cleanup Information sheet presented here is an early draft, not the final that was distributed to the HAB. A copy of the final is included in the 3/27/95 letter that is attached to these comments.

47. Revised Summer's Model Calculation: EPA and Ecology do not support the revisions and results of the revised Summer's Model calculations. There is significant concern the results of this effort could be interpreted as representing remediation criteria for contaminants in soils. Such an interpretation would not be consistent with ongoing TPA dialogue regarding how to properly establish numerical standards in soils that are protective of groundwater where that is the primary consideration.

48. Appendix E 100-HR-1 FFS; Page E2-8, Section 2.4.2 Refined Contaminants of Potential Concern. It is noted here that the discussions in paragraphs three and four concerning PRGs is that the PRGs are based on a recreational scenario. This is a very important qualifier to the statement in paragraph three that states..."The PRG represents a maximum concentration of a contaminant that would not exceed an acceptable human health or ecological risk level,...".

49. Page E2-8 Paragraph Three. The discussion at the end of this paragraph regarding CRQL/CRDL considerations appears to be based on questionable logic. There is a discussion on page A-16 regarding the use of CRQL/CRDL as criteria when contaminants have been identified and a lower limits (than CRQL/CRDL) have been negotiated for analytical services. This is typically achieved by requesting Special Analytical Services (SAS) for specific analytes where method detection limits are lower than CRQL/CRDL and can routinely provide positive, non-qualified data. It is not apparent from the discussions on pages A-16 and E2-8 that SAS was requested and used in this manner.

50. Page E7-1 through E7-3. EPA and Ecology agree with the statements presented in these sections that indicate the Process Document and Sensitivity Analysis presented sufficient information to proceed with the regulatory framework since it very closely paralleled an existing risk based scenario. The specific statements include:

"The development of the remedial alternatives in the 100 Area Feasibility Study Phases 1 and 2 (DOE-RL 1993a) and the Process

Document are not influenced by the change in cleanup goals, so the number and type of remedial alternatives remain the same."

"...there is no change in the assessment of these alternatives with regards to the CERCLA evaluation criteria and NEPA issues."

[Note: this is in reference to the Remove/Dispose and Remove/Treat/Dispose alternatives]

"Therefore, the detailed analysis of alternatives in the Process Document and this 100-HR-1 FFS Appendix remain valid."

[Note: this is in reference to the Remove/Dispose and Remove/Treat/Dispose alternatives]

"...it does not change the relative advantages and disadvantages of the two alternatives and therefore, the comparative analysis remains essentially the same."

"...the results of the comparative analysis remain the same."



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10 HANFORD PROJECT OFFICE  
722 SWIFT BOULEVARD, SUITE 5  
RICHLAND, WASHINGTON 99352

March 27, 1995

Linda McClain  
U.S. Department of Energy  
P.O. Box 500, H4-83  
Richland, Washington 99352

Dear Ms. McClain;

As we discussed on February 27, 1995, and presented to the Hanford Advisory Board (HAB) on March 2, 1995, several issues related to the first set of 100 Area Proposed Plans (100-BC-1, 100-DR-1, and 100-HR-1 source operable units that received liquid radioactive effluent) and a subsequent Record of Decision have been examined by EPA, Ecology, DOE-RL, DOE-HQ, and DOE's contractors over the past several months. The issues include; what will be included in the first ROD; what will be considered "protective of human health and the environment"; at what date(s) must "protectiveness" be achieved; is radioactive decay a reasonable variable for consideration; and, how will institutional controls fit into the decision matrix.

At our joint meeting on February 27, 1995, the understanding and expectation by EPA and Ecology was that sufficient staff and management dialogue and agreement had been reached among the TriParties to proceed with the final revisions and submittal of the first set of 100 Area Proposed Plans by DOE to the regulatory agencies. Our expressed expectation was that they would be finalized the week of March 20th to initiate concurrent, final approval by all three organizations with a target of mid-April for the commencement of a public comment period. Furthermore, our expectation was that those documents would reflect the regulatory framework agreed to on February 27th and reiterated in this correspondence. The framework follows the two page 100 Area Cleanup Summary (enclosed) provided by the TriParties to the HAB on March 2nd. As you know, the TriParties committed to the HAB that the three proposed plans would be ready by the April 6th HAB meeting. It is the intent of EPA and Ecology to meet that commitment.

Our respective staffs have spent considerable time editing the 100-HR-1 Proposed Plan which is intended to serve as a template for the other two plans. At this juncture we believe the most expedient course of action is for EPA and Ecology to present to DOE final proposed plans for the three operable units. These will be transmitted to your office the week of March 27th.

Linda McClain

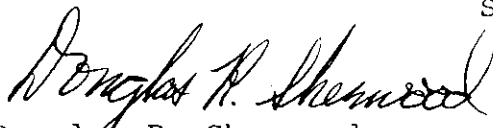
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March 27, 1995

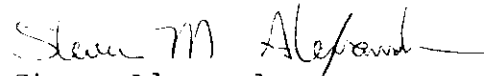
In addition, an evaluation of cost estimates for 100 Area remedial action alternatives was performed and is attached to this correspondence for your consideration. Our analysis indicates that the initial cost are over estimated by a factor of three to four. It is our belief that early remediation activities in the 100 BC area being planned for implementation this summer would yield very beneficial information in several areas, including cost realism.

If you have any questions concerning this correspondence or related matters, please contact Phil Staats or Kevin Oates at 736-3029 and 376-6623, respectively.

Sincerely



Douglas R. Sherwood  
U.S. Environmental  
Protection Agency



Steve Alexander  
Washington State  
Department of Ecology

Enclosure

cc: Julie Erickson, DOE  
Kevin Oates, EPA  
Phil Staats, Ecology  
Nancy Werdel, DOE  
Administrative Record (100-BC-1, 100-DR-1, 100-HR-1)

## REGULATORY FRAMEWORK FOR 100 AREA DECISION DOCUMENTS

**Proposed Plans and Records of Decision** Proposed Plans and Records of Decision (ROD) for the 100 Area will be developed to address source operable units (OU's) and groundwater OU's separately. The first ROD is expected to address those sites in 100-BC-1, 100-DR-1 and 100-HR-1 that received liquid radioactive effluent. This decision was made to address the public value placed on protection of the Columbia River.

**Source OU's** The source OU's within the 100 Area have been placed into four general categories in the Sensitivity Analysis Addendum to the 100 Area Process Document. A convention of Category 1, 2, 3 and 4 has developed from this distribution of waste sites. This represented in the table below.

CATEGORY	REPRESENTATIVE GROUP	COMMENTS
1	RETENTION BASIN	LARGE SITES, ENGINEERED STRUCTURE NEAR SURFACE, SOME PLUME EXPECTED
2	PROCESS EFFLUENT TRENCH	CONTAMINATION AT DEPTH
3	FUEL STORAGE BASIN TRENCH	SMALL SITES NEAR SURFACE
4	PLUTO CRIB	SMALL SITES NEAR SURFACE

**Observational Approach** During remedial action, the observational approach will be utilized to determine both the lateral and vertical extent of contamination.

**Institutional Controls** There are some portions of the 100 Area that, due to existing groundwater contamination, will require institutional controls. In this sense, some portions of the 100 Area will be "restricted" until such a time that groundwater contaminants attain levels that allow for a prescribed usage.

**Protection of Human Health and the Environment** The decision was made to evaluate individually the potential risks associated with human and ecological receptor exposure to soils and potential impacts to groundwater. This leads to a two question approach to the decision making process for OU-specific remediation. The questions to be asked are..."Does the site pose an unacceptable risk due to potential human and/or ecological receptor exposure to soils ?"...and..."Does the site pose a current or potential for a future adverse impact to groundwater below the site ?" A "Yes" answer to either question would trigger remediation.

**Cleanup Goals** The Model Toxics Control Act will be applied as the ARAR for soil remediation for metals and organic contaminants. This will be met by the year 2018 for sites where metals and/or organics are the primary drivers for remediation. The proposed EPA/NRC criteria of 15 mrem above background would be applied for radiation soil sites. This is consistent with EPA risk assessment methodology and the Hanford Site Risk Assessment Methodology. The 15 mrem criteria equates approximately to a  $3 \times 10^{-4}$  residential risk. Maximum Contaminant Levels (MCL's) under the Safe Drinking Water Act and Fresh Water Quality Criteria (FWQC) under the Clean Water Act would be applied for groundwater consideration. These are discussed in more detail below.

**Soil Exposure** The assumption made for sites that fall within Categories 1, 3 & 4 is that existing clean fill that has been placed over the sites would be removed. Then the observational approach would then be implemented until cleanup goals for soils is achieved. For sites in Category 2 the assumption made is that, due to the depth of contamination, there is no current potential adverse human health or ecological affects associated with soil exposure.

**Groundwater Consideration** The sites also would be evaluated to determine if there is a potential for adverse impacts to groundwater. There are multiple categories and considerations under this topic. First, there are sites that have already impacted groundwater. The emphasis on remediation of these sites would be to ensure that any future potential migration of contaminants to the water table would not result in higher levels of contaminant concentration in groundwater. This approach recognizes trend plots which indicate that concentrations of contaminants in groundwater have been steadily decreasing over time. This suggests that the mass of mobile contaminants that will reach the water table have already done so. It is recognized that there may be a need during remedial design and remedial action (RD/RA) to further explore this assumption. The remedial action objective for such sites is to be protective of the Columbia River such that FWQC are not exceeded. This will require, at a minimum, two groundwater monitoring locations and a modeling effort to demonstrate that concentrations of contaminants in groundwater will not exceed FWQC at the river.

Secondly, there are sites that have not impacted groundwater but potentially may adversely impact groundwater at some future date. A "non-degradation" approach has been developed that sets a point of compliance at the water table beneath the waste site such that MCL's would not be exceeded.

As noted above, for sites in Category 2, the assumption made is that due to the depth of contamination, there is no current potential adverse human health or ecological affects associated with soil exposure. Therefore, these sites would be candidates for remediation if there exists a potential adverse impact to groundwater. It is recognized that the level of radioactivity associated with a "deep site" needs to be taken into account, as does long-term monitoring, operation and maintenance costs.

**Radioactive Decay** The discussion of radioactive decay has focused on remediation of sites in the 100 Area where radioactivity is the primary driver for remediation of a site. This was discussed specifically in the context of sites where strontium 90 and cesium 137 are the principal contaminants, since these are two relatively non-mobile contaminants that would realize three half-life cycles within a 100 year timeframe.

The extent of removal of contaminants at deep sites will be determined on a case by case basis (six are considered to be candidates in the first three proposed plans). Where appropriate, decay of radionuclides will be evaluated and balanced against such factors as protection of human health and the environment, costs, sizing of the ERDF, worker safety, disturbance of environmental and cultural resources, the use of institutional controls and long term monitoring considerations. In all instances the goal will be to achieve cleanup levels that will not preclude any future use due to Hanford contaminants.

It is also recognized that it may be appropriate to remediate sites within the immediate "shadow" of the reactors at the time that the reactors are remediated. The shadow has been discussed as a 50 meter radius. This would be evaluated on a site by site basis.

**Ecological Risks** The FFS and supporting documents discuss protection of ecological receptors as a remedial action objective. Analysis in the Sensitivity Analysis indicates that for sites that are cleaned up to levels that are protective of human health, for all contaminants except strontium and technetium, the levels will also be protective of the target ecological receptor - a single great basin pocket mouse. The conservative nature of this assessment is discussed in the text of the appropriate site documents.

**Decision Matrix Inputs** The list below represents appropriate inputs to a decision logic that would be applied during RD/RA to address uncertainty associated with sites that have limited characterization information, particularly Category 2 sites. The

expectation is that remedial activities would be conducted utilizing field instrumentation. Confirmatory sampling would also be utilized to verify the remedial action has met the cleanup goals.

- o ERDF Footprint
- o Minimizing Adverse Impacts to Cultural Resources
- o Minimizing Adverse Impacts to Environmental Resources
- o Observational Approach versus Test Borings for characterization
- o RAD Activity levels
  - Isotope specific
- o Depth of Contamination
- o Distribution in Soils
- o Depth to Groundwater
- o Cost for Remediation vs Long Term O&M
- o Worker Safety
- o Field Screening Methodologies
- o Confirmational Sampling for Closeout
- o GW Modeling for Potential Impact from Sources to GW
  - Data Needs
  - Assumptions
  - Kd values
- o Post-RA Monitoring....5-yr Reviews
- o Coordination of Source Activities with GW-OU Activities.

To: Hanford Advisory Board  
From: Tri-Party Agencies  
RE: 100 Area Clean Up Information Sheet

The information below concerns the clean up activities in the 100 area. This information is being faxed to foster discussions during Thursday afternoon's 100 area discussion. There are two pages to this fax.

Over the last several months the agencies have been working to develop clean up plans (ie proposed plans) for the first three operable units in the 100 Area. These units are 100-BC-1, 100-DR-1 and 100-HR-1. The proposed plans will focus on the radioactive liquid waste disposal sites such as cribs, trenches and retention basins. The solid waste burial grounds and septic tanks associated with these areas will be covered in subsequent plans.

There are approximately 30 waste sites that will be addressed in these plans. In earlier discussions with the board the agencies shared that the preferred alternative for the 100 area as a remove and dispose option. The discussions over the past several months have focused on issues such as cleanup levels, timing for the clean up, how reactor removal influences cleanup decisions, and early clean up.

The agencies have come to agreement on clean up levels for these waste sites. The State of Washington Model Toxic Control Act (MTCA) will be used to generate chemical/metals clean up levels. The agencies are considering the use of the proposed EPA and NRC standard of 15 millirem above background for the radioactive component clean up standard; this equates to a  $10^{-4}$  clean up level under CERCLA. This also is consistent with EPA risk assessment methodology and the Hanford Risk Assessment Methodology. For sites that have impacted groundwater, the Freshwater Quality Criteria standards for protection of the Columbia River will be used to establish clean up levels. In sites that have not impacted groundwater the chemical specific Maximum Contaminant Levels under the Safe Drinking Water Act will be used.

In regard to the timing of clean up, the agencies believe that a phased approach should be used. Sites will be prioritized by size and location during the remedial design phase with an emphasis on sites that have impacted groundwater. The remedial design phase occurs after the record of decision is issued. Those sites that are in close proximity (50 meters has been discussed) of the reactor are proposed to be deferred for clean up until such time that the reactors are removed.

Removal of contaminants at deep sites will be determined on a case by case basis. Where appropriate, decay of radionuclides will be evaluated and balanced against protection of human health and the environment, costs, sizing of the ERDF, worker safety,

disturbance of environmental and cultural resources, the use of institutional controls and long term monitoring considerations. In all instances the goal of the clean up will be completed to a level that will not preclude any future use due to Hanford contaminants.

The three agencies have been working with the Department of Energy Headquarters on a new project called the Streamline approach for Environmental Restoration (SAFER). This approach combines the data quality objective method with the observational approach. The agencies plan on using this process to do remedial design and remedial action planning in order to begin remedial action at several key sites in the 100-BC area this summer. The three agencies will be involved in upfront planning for this project and will keep the board and affected Indian Tribes apprised of the progress of this project.

The schedule for the first three clean up plans is to have the proposed plans ready for the board at the April meeting. The agencies expect to begin public comment by mid-April with record of decision being issued this summer.

Memorandum

March 1, 1995

Subject: 100 Area Cost Estimates

From: Kevin J. Oates



To: Distribution List (100 Area Unit Managers)

Introduction: The cost estimates developed by the U.S. Department of Energy and its contractors for remedial action alternatives in the 100 Area have been the topic of considerable technical dialogue as the first round of draft feasibility studies and proposed plans have undergone regulatory review. Public perception concerning the true costs of doing business at Hanford are that it is likely to be considerably less than those estimated to date. Review of recently received backup documentation of cost estimates for the 100 Area remedial action alternatives indicates that there is considerable conservatism built into the estimates, as well as application of extensive administrative charges. This memo examines the specifics of the cost estimate provided for a generic 100 Area Retention Basin with an assumed contaminated volume of 447,998 cubic yards and provides commentary on areas where assumptions need to be revisited and re-evaluated for cost realism. In addition, the effects of potential reductions to the Retention Basin cost and 100 Area-wide roll up estimates are presented.

Detailed Analysis: Summary Page 3 (Page E-3) from the 100 Area Source Operable Unit Focused Feasibility Study Cost Models Document (BHI-00137 November, 1994) is presented below and is referred to in subsequent discussions. These discussions will proceed through the elements in the order presented below.

<u>Element</u>	<u>Total Cost</u>
Offsite Analytical	\$896,730
Fixed Price Contractor	\$40,057,286
WHC	<u>\$1,256,637</u>
Subtotal	\$42,210,653
Overhead (15%)	\$6,008,593
Profit (8%)	\$3,270,677
Bond	\$204,275
B&O Tax	\$232,842
Subcontractor MPR	<u>\$497,737</u>
Subtotal	\$52,424,777
Project/Construction Management (15%)	\$7,729,207
G&A/Common Support Pool (25%)	\$15,110,600
Contingency (35%)	<u>\$27,095,250</u>
Total	\$102,359,834

The ratio of the Total Cost (work plus overhead, profit, indirect etc) to the first subtotal (the actual cost of the work performed) is 2.48 to 1. The ratio of the Total Cost to the second subtotal (actual cost of the work plus subcontractor overhead, profit and indirect is 1.95 to 1. It is assumed that the two of the elements in the second subtotal - Overhead and Profit - are charges related to the Fixed Price Subcontractor costs in the second line under Element.

A narrative description of the cost elements is provided in the 100 Area FFS documents. However, those descriptions are very general in nature, and in some cases (G&A) too vague to ascertain the true elements of the cost item. Descriptions can be found in the Federal Acquisition Regulations (Chapter 31) and in the Federal Acquisition Circular 90-12 that would be more appropriate.

#### ITEMIZED REVIEW

Offsite Analytical Costs/WHC Analytical Costs: In general, the three categories (Characterization, QC, Certification) listed for offsite costs are within normal parameters. It was assumed that 90 % of the analyses would be performed by WHC via an onsite mobile lab. However, the approach envisioned for 100 Area remediation will emphasize field screening with a minimal percent (likely 10%) corroboration at a fixed and/or mobile lab. Certification will require a level of effort equivalent to that assumed in the cost estimate. The costs for the activities is listed below.

Activity	No. of Samples	Percent	Unit	Total
Characterization	77	10	\$4210	\$325K
QC	44	6	\$4210	\$185K
Certification	92	NA	\$4210	\$387K
WHC Mobile Lab	687	90	\$400	\$275K
Total				\$1,172K

**ISSUE:** It is likely that incremental cost reductions can be realized in the areas of Characterization and WHC Mobile Lab in the context of more recent discussions regarding analytical services for 100 Area remediation.

Fixed Price Contractor: At the Level 1 User category the listed cost estimate is \$40,057,286. Of this amount, approximately \$31.4M is for disposal fees at the ERDF. This cost is above and beyond all analytical, excavation, transportation, backfill and revegetation costs. This represents the tipping fee at the ERDF gate which was calculated at a \$70/cubic yard rate. There are two issues that need to be examined here.

First, the \$70/CY rate needs to be examined in light of comparative cost estimates that were developed for various ERDF construction options that suggest a rate of approximately \$17/CY

for the selected operational design, as well as a recent initiative to privatize the ERDF to reduce all costs, including tipping fees. Secondly, there is a need to confirm within both the DOE-RL-ER and DOE-RL-WM programs that tipping fees from 100 Area wastes are expected, and have been budgeted for the outyears, to pay for the Capitalization and Operation and Maintenance of ERDF. Therefore, should be little or no budgeted items in the WM budget for ERDF activities.

Additionally, the issue of Overhead and Profit charges associated with the Fixed Price Contractor need to be re-evaluated. It appears that the Fixed Price Contractor is receiving a 15% Overhead (\$6,008,593) and an 8% Profit (\$3,270,677) on the amount of \$40,057,286 for a total of \$9,279,270. It appears that DOE-RL would be paying a substantial amount for Profit and Overhead for what are essentially pass through charges on tipping fees that constitute 78.3% of the Fixed Price subcontractor costs (\$31,359,860 over \$40,057,286 = 78.3%). By structuring contracts such that DOE-RL would be billed directly for tipping fees, a cost reduction of \$7,264,511 would be realized (\$9,279,270 x 0.783 = \$7,264,511) yielding a revised Overhead and Profit total of \$2,014,758.

Implications for Lower Tipping Fee: If one assumes that the lower estimate of \$17/CY is accurate, and that all of the administrative charges and associated percentages are valid, the bottom line cost for the generic Retention Basin would drop from \$102,359,834 to \$44,932,632. Again, it is important to note that the costs associated with Retention Basin remediation comprised between 50 and 80 percent of the estimated total 100 Area source remediation cost (and therefore budget) projections.

#### Detailed Breakdown

<u>Element</u>	<u>Total Cost</u>
Offsite Analytical	\$896,730
Fixed Price Contractor	\$16,313,392
WHC	<u>\$1,256,637</u>
Subtotal	\$18,466,759
Overhead (15%)*	\$2,447,008
Profit (8%)*	\$1,305,071
Bond	\$204,275
B&O Tax	\$232,842
Subcontractor MPR	<u>\$497,737</u>
Subtotal	\$23,153,692
Project/Construction Management (15%)	\$3,473,053
G&A/Common Support Pool (25%)	\$6,656,686
Contingency (35%)	<u>\$11,649,201</u>
Total	\$44,932,632

\* This does not take into account potential reductions associated with the previous analysis concerning Profit and Overhead charges.

**ISSUE:** Among the technical inputs to the cost estimate, the Disposal Fee item has, by far, the greatest potential to significantly impact actual costs. Therefore, the rate for disposal should be re-evaluated to reflect more recent estimates.

**ISSUE:** DOE-RL needs to verify that tipping fees charged on an OU-by-OU basis represent the costs associated with Capitalization and O&M of the ERDF facility.

**ISSUE:** DOE-RL should consider structuring contracts associated with the transportation and disposal of waste at the ERDF in such a manner that DOE-RL is billed directly for charges associated with tipping fees, in order to avoid paying Overhead and Profit charges associated with pass through costs for tipping fees.

Monitoring, Sampling, & Analysis Detail Page 9.

It appears that one piece of field equipment will be renting at the rate of \$75 per hour for 2091.54 hours for a total cost of \$156,865.

**ISSUE:** A value engineering analysis should be undertaken for the In Situ Monitoring Equipment costs to determine if purchase is more economically advantageous to the Government than rental. Consideration should be given to re-use at the site.

Solids Collection & Containment Detail Pages 12, 15 and 16.

Pg 12 Hyd Excav, Crwlr, 5.4 CY Bkt	\$142/HR = \$55K
Ldr, FE, WH, 8 CY Bkt	\$87/HR = \$34K
Dozer, Cwlr, Cat D-10N	\$105/HR = \$41K
Pg 15 Hyd Excav, Crwlr, 5.4 CY Bkt	\$142/HR = \$243K
Ldr, FE, WH, 8 CY Bkt	\$87/HR = \$148K
Dozer, Cwlr, Cat D-10N	\$25/HR = \$43K

(NOTE: Hourly rate for the third equipment item is not consistent from page 12 to page 15)

Pg 16 Trk, Wtr, Off-Hwy 6000 Gal	\$60/HR = \$102K
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Together these items represents 56% of the total costs under this item.

**ISSUE:** Value engineering analyses should be undertaken to determine best value to the Government for four pieces of equipment listed on these pages due to high short term rental rates and subsequent high capital costs.

Disposal (Other than Commercial) Detail page 21.

Off-Road Tractor Trailer

\$60/HR = \$1,405,368

This item represents 66% of the total costs under this item.

**ISSUE:** Value engineering analyses should be undertaken to determine best value to the Government for one piece of equipment listed on this page due to rental rates over a long period of time and subsequent high capital costs.

Site Restoration Detail Page 24 to 27.

Under this category a total cost is estimated at \$4,369,308. Of this total, \$48,793 is associated with material, equipment and labor for revegetation activities. Equipment rental costs for backfill and regrading equipment are approximately \$2,458K (56%).

**ISSUE:** As indicated in previous discussions, a value engineering analysis should be undertaken regarding the cost of rental versus purchase for multiple use.

ADMINISTRATIVE COSTS

Overhead and Profit.

As discussed previously, there is opportunity for DOE-RL to realize cost reductions in this area by avoiding payment of overhead and profit on what are essentially pass through charges associated with ERDF tipping fees.

Project Construction and Management (15%) - \$7,729,207

G&A/Common Support Pool (25%) - \$15,110,600

Contingency (35%) - \$27,095,250

Together, these three items represent 49% (approx \$50M) of the total for the generic Retention Basin cost estimate. The percentages presented under all three items either represent the high end of industry standards or are above what is considered within the normal range. For the first two items, BHI has reportedly developed new rates for its' contract at Hanford that are lower than those presented in the Cost Estimate. The new rates need to be applied.

In regard to the 35% contingency, this should be re-evaluated in context of the conservatism that was applied to the volume estimate. In that estimate, it was assumed that contamination was homogeneous throughout the basin, and that it extended to the water table. This represents an extremely conservative approach to development of a volume estimate. The application of a large engineering contingency in addition to this is not warranted or supportable. Similar conservatism was applied throughout the 100

Area waste site cost estimates. Therefore, it would be reasonable to re-evaluate the 100 Area total cost estimate from standpoint of being, at a minimum, 35% overly conservative across the board.

#### Cumulative Effect of Cost Reductions

This last section evaluates the cumulative effect of applying cost reductions to the elements discussed in the previous pages. In addition, the effects of similar reductions on costs developed for eight waste site types in the 100 Area Process Document (DOE/RL-94-61), as well as a subsequent 100 Area-wide cost rollup, are evaluated.

The assumptions used in developing the reductions to the cost estimate for the generic 100 Area Retention Basin are as follows and are presented in the table below.

1. For the element titled "Offsite Analytical Costs" an assumption was made that a 20% incremental savings could be realized for the Characterization and WHC Mobile Lab sub-elements.
2. For the element titled "Fixed Price Contractor" a tipping fee of \$17/CY was applied.
3. For the elements titled "Overhead" and "Profit" it was assumed that pass through costs for tipping fees would not be subject to overhead and profit by the fixed price subcontractor.
4. The element titled "Contingency" was eliminated due to the overly conservative nature of the volume estimating procedure.

<u>Element</u>	<u>Cost</u>	<u>Revised</u>
Offsite Analytical	\$896,730	\$776,730
Fixed Price Contractor	\$40,057,286	\$16,313,392
WHC	<u>\$1,256,637</u>	<u>same</u>
Subtotal	\$42,210,653	\$18,346,759
Overhead (15%)	\$6,008,593	\$538,341
Profit (8%)	\$3,270,677	\$287,115
Bond	\$204,275	same
B&O Tax	\$232,842	same
Subcontractor MPR	<u>\$497,737</u>	<u>same</u>
Subtotal	\$52,424,777	\$19,172,215
Project/Construction Management (15%)	\$7,729,207	\$2,875,832
G&A/Common Support Pool (25%)	\$15,110,600	\$5,512,011
Contingency (35%)	<u>\$27,095,250</u>	<u>eliminate</u>
Total	\$102,359,834	\$27,560,058

The revised cost estimate yields a reduction of \$74,799,776 or 73.1 percent. It is of note that additional elements within the cost estimate additional reductions could be realized. For example, lower Project/Construction Management, G&A/Common Support Pool rates reportedly developed by BHI for Hanford would reduce the cost of those elements. Bond, B&O Tax, and Subcontractor MPR rates would also be reduced under a lower Fixed Price Contractor element.

The last evaluation undertaken applied a 73.1 % reduction to the Remove/Dispose cost estimate for the remaining waste site types. A comparison is presented below.

<u>Site Type</u>	<u>Cost Estimate</u>	<u>Reduced Cost</u>
Sludge Trenches	\$1,746,550	\$469,821
Fuel Storage Basin Trenches	\$4,687,520	\$1,260,942
Process Effluent Trenches	\$16,508,130	\$4,440,686
Pluto Cribs	\$277,310	\$74,596
Dummy Decon Cribs/French Drains	\$401,110	\$107,898
Pipelines	\$47,040,420	\$12,653,872
Burial Grounds	<u>\$1,219,770</u>	<u>\$328,118</u>
Total	\$70,840,390	\$19,335,933

When applied to the 100 Area-wide roll up the range of estimates associated with the various land use, and therefore exposure scenarios, associated with the Remove/Dispose alternatives are reduced as presented below.

<u>Scenario</u>	<u>Cost Estimate</u>	<u>Reduced Cost</u>
Complete Excavation	\$3.0B	\$807M
Frequent Use	\$2.2B	\$592M
FFS	\$2.1B	\$565M
Occasional Use	\$1.8B	\$484M
Modified Frequent Use	\$1.7B	\$457M

**SUMMARY** The preliminary cost estimates developed for potential remedial actions in the 100 Area are conservative in nature and should only be regarded as functional for comparing and contrasting potential remedial actions. Early remedial actions that are being contemplated for the summer of 1995 in the 100 B/C operable unit would yield a greater degree of cost realism for budget projection purposes. This analysis has identified several areas where reductions in cost from the preliminary estimate to the "real time" remediation cost are likely to be realized.